

- 1 1. A method comprising:
2 forming a trench through said cladded waveguide;
3 partially filling said trench with a filler
4 material; and
5 forming a thin film filter aligned with said
6 waveguide on said filler material.
- 1 2. The method of claim 1 including partially filling
2 said trench with a material whose index of refraction is
3 close to that of cladding on said waveguide.
- 1 3. The method of claim 1 including detecting light
2 of a first wavelength reflected by said thin film filter.
- 1 4. The method of claim 3 including detecting light
2 of a second wavelength passed by said thin film filter and
3 reflected by a reflective surface of said trench.
- 1 5. The method of claim 1 including forming a
2 multilayer thin film filter that reflects light of at least
3 one wavelength and passes light of another wavelength.
- 1 6. The method of claim 1 including using said filter
2 to demultiplex a multiplexed signal including light at 1550
3 nanometers and light at 1490 nanometers.

1 7. The method of claim 6 including multiplexing a
2 signal at 1310 nanometers.

1 8. An optical demultiplexer comprising:
2 a semiconductor substrate;
3 a waveguide core over said substrate;
4 a thin film filter to reflect light of at least
5 one wavelength and to pass light of at least one other
6 wavelength arranged in alignment with said waveguide core;
7 and
8 a reflective surface aligned with said thin film
9 filter and said waveguide core to reflect light of a
10 wavelength passed by said thin film filter.

1 9. The demultiplexer of claim 8 including a
2 photodetector arranged to detect light reflected by said
3 thin film filter.

1 10. The demultiplexer of claim 8 including a
2 photodetector to detect light reflected by said reflective
3 surface.

1 11. The demultiplexer of claim 8 including upper and
2 lower cladding on said core and a trench through said
3 cladding defining said reflective surface, said trench
4 filled with a filler material whose index of refraction

5 matches that of said cladding, said thin film filter formed
6 on said filler material.

1 12. A method comprising:
2 forming a slot between a pair of waveguide cores
3 in a planar light circuit; and
4 inserting a thin film filter between said
5 waveguide cores.

1 13. The method of claim 12 including mounting said
2 thin film filter on a U-shaped module so that a portion of
3 said thin film filter is unsupported.

1 14. The method of claim 13 including forming an
2 aperture in said planar light circuit to receive said
3 module and inserting said thin film filter into said slot
4 and inserting said module into said planar light circuit
5 aperture.

1 15. The method of claim 14 including providing
2 alignment marks on said module and said planar light
3 circuit to align said module with said planar light
4 circuit.

1 16. A planar light circuit comprising:
2 a first waveguide and a second waveguide, said
3 waveguides separated by a slot; and
4 a thin film filter in said slot between said
5 waveguides.

1 17. The circuit of claim 16 wherein said waveguide is
2 attached to a module.

1 18. The circuit of claim 17 including an aperture in
2 said planar light circuit to receive a portion of said
3 module.

1 19. The circuit of claim 18 including alignment marks
2 on said module and said planar light circuit.

1 20. The circuit of claim 19 wherein said module is U-
2 shaped including a slot through its lower surface providing
3 an unsupported portion of said thin film filter.

1 21. The circuit of claim 20 wherein said slot fits
2 over a portion of said planar light circuit and allows one
3 of said waveguides to pass through said module.

1 22. A planar light circuit comprising:
2 a first waveguide; and
3 a trench formed in said planar light circuit,
4 said trench having a curved reflective surface, said
5 surface to act as a mode converter.

1 23. The circuit of claim 22 wherein said reflector is
2 spherical.

1 24. The circuit of claim 22 including a laser mounted
2 over said trench on said circuit.

1 25. The circuit of claim 24 including a vertical
2 cavity surface effect laser mounted over said trench.

1 26. The circuit of claim 22 including a detector
2 mounted over said trench.

1 27. A method comprising:
2 forming a trench in a planar light circuit;
3 forming a curved reflective surface in said
4 trench aligned with a waveguide in said circuit; and
5 using said reflective surface to convert the mode
6 of light extending to or from said waveguide.

1 28. The method of claim 27 including mounting a laser
2 over said trench on said circuit.

1 29. The method of claim 27 including forming a
2 spherical reflective surface.

1 30. The method of claim 27 including mounting a
2 vertical cavity surface effect laser over said trench.

1 31. The method of claim 27 including mounting a
2 detector over said trench.